

## **Weathering the crisis - climate and Corona – PIK Alumni Newsletter, No. 3, 12/2020**

### ***Welcome from the Directors***

Dear PIK Alumni,

This third issue of the PIK Alumni newsletter brings you a lot of positive news and achievements that have occurred in the last months of 2020 – even though this year has been unprecedented. The corona pandemic affected both our work and private lives. For us like everyone, the last few months have posed quite a challenge – a challenge we have faced, and continue to face, we hope, successfully to deliver outstanding research. Talking about research during Corona, data shows that during lockdown the PIK supercomputer has been used more than ever; a high number of model runs have been performed by our scientists. Also, the PIK publication numbers look good as our scientists' hard work continues to generate insights on a multitude of specialist topics. This is reflected in the list of [highly cited scientists compiled by the Web of Science](#). More PIK researchers than ever are amongst the top 1% of their category, almost equally distributed between natural and social sciences and with many of them scoring well in the cross-field category.

PIK's Director Ottmar Edenhofer [was awarded the Deutscher Umweltpreis](#), which is another great recognition for PIK. Our research resonates strongly amongst scientists and stakeholders – which is why the [social media company Facebook approached us](#) for regular scientific contributions for their Climate Science Information Center on their platform. This Alumni newsletter edition gathers the highlights of PIK's latest research: They cover a great variety of topics, from Covid19-related research and NASA-led findings about Antarctica and Greenland to studies about rewetting peatlands to limit emissions and analysing data to reconstruct the past climate.

We hope you enjoy browsing through PIK's latest achievements – we are proud that even in times of social distancing most people like to work at PIK, as a recent survey amongst PIK colleagues showed. This is because of the exciting research agenda, but also because of the cooperative attitude of the people at PIK. That is important, and we dare say it is really one of our most important assets. We as a scientific institute are performing highly, but at the same time we have a culture of trust, respect, and mutual support. We are convinced these things go hand-in-hand, i.e., that our culture of cooperation contributes to our success. We hope you will pass on this truly unique PIK spirit in your current field of employment.

We wish you all a happy and healthy festive season and a happy new year!

Ottmar Edenhofer, Johan Rockström, and Bettina Hörstrupp

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## Developments at PIK

In August Bettina Hörstrup joined PIK as Administrative Director, completing the Board of Directors. Bettina was previously Head of Human Resources and deputy to the Administrative Board at GFZ, just next door to PIK, and brings with her a wealth of experience ranging from managing the crisis team at GFZ to the legal background of a trained lawyer.

PIK is working towards its seven-yearly Evaluation by the Leibniz Association, which takes place in spring 2021. A successful evaluation is not only essential for securing PIK's core funding for the coming years, but is also critical for our further strategic planning.

We'd like to invite you to explore PIK's newly re-launched website. The re-design offers a clean and sciency look, improved user experience, responsive design for use on mobile devices, and some new functionalities such as the topic sites, which group information on seven key research topics. Please take a look: <https://www.pik-potsdam.de/en>! The switch-over to the new interface has caused a few minor teething problems, which our web team are sorting out successively.

## PIK Research

### Climate and Corona

While the ongoing Corona pandemic continues to threaten millions of lives around the world, the first half of 2020 saw an unprecedented decline in CO2 emissions – larger than during the financial crisis of 2008, the oil crisis of 1979, or even World War II. An international team of researchers has found that in the first six months of this year, 8.8 percent less carbon dioxide were emitted than in the same period in 2019 – a total decrease of 1551 million tonnes. Hans Joachim Schellnhuber was one of the co-authors of the study in Nature Communications. [Read more ...](#)

In another study, a group of PIK researchers compared the Corona crisis with the climate emergency and showed that the dynamics of the COVID-19 pandemic could offer valuable insights for efforts to mitigate climate change. Highlighting the parallels between the global health and the climate emergency, the team (Kira Vinke, Sabine Gabrysch, Emanuela Paoletti, Johan Rockström, and Hans Joachim Schellnhuber) analysed what policymakers and citizens can learn from the corona outbreak and how to apply it to the global effort of reducing CO2 emissions. Their proposal: A Climate Corona Contract that unites the younger and the older generations. [Read more ...](#)

The new PIK focus on health seems timely, and Sabine Gabrysch, head of PIK's Research Department on Climate Resilience and Charité Professor, has been appointed as a member of the advisory council 'One Health', recently established by the Federal Ministry for Economic Cooperation and Development (BMZ). The council looks into questions like what can be learned from the Corona pandemic, and what are the links between human and animal health, the environment, climate and biodiversity. Recently, the 2020 Lancet Countdown, an international Report on Health and Climate Change, was released together with an associated scientific policy brief for Germany, to which Sabine Gabrysch heavily contributed. These highlighted the health effects of climate change and made proposals for a healthy future. Read more [here on the appointment](#) and [here on the reports](#).

### Ice studies

A number of studies from Research Department 1's ice group have highlighted the threat of ice loss. Firstly, a study on ice loss in Antarctica revealed the high risk for long-term sea-level rise. In a cover story in Nature in September, the researchers from PIK, Potsdam University and Columbia University

looked at how much warming the Antarctic Ice Sheet can survive. Their unprecedentedly detailed simulations (using around one million hours of computation time) delineate where exactly and at which warming levels the ice would become unstable and eventually melt and drain into the ocean. They found a delicate concert of accelerating and moderating effects, but that unmitigated climate change would have dire long-term consequences: If the global mean temperature level is sustained long enough at 4 degrees above pre-industrial levels, Antarctic melting alone could eventually raise global sea levels by more than six metres. [Read more ....](#)

Also this year, PIK researchers contributed to a big international effort led by NASA to produce extensive analyses of Antarctica's and Greenland's future mass loss. The ISMIP6 Ice Sheet Model intercomparison project, led by NASA's Goddard Space Flight Centre in Maryland, investigates in computer simulations how ice sheets respond to global warming. The results will play a decisive role in the IPCC 6th Assessment Report. With their ISMIP6 companion study, PIK scientists Ronja Reese et al. contributed key findings for the future evolution of the Antarctic Ice Sheet. [Read more ...](#)

A further study on ice loss in the Arctic showed it to be a vicious circle. The loss of huge ice masses can contribute to warming, which in turn causes more loss and further risks. Nico Wunderling and co-authors quantified this feedback by exploring long-term if-then-scenarios in a study in Nature Communications. If the Arctic summer sea-ice were to melt completely – a scenario that could become reality at least temporarily within this century – this could eventually add roughly 0.2°C to global warming. This is, however, not in addition to IPCC projections of future warming since these already take the relevant mechanisms into account. Still, the scientists could now separate the effects of the ice loss from other effects and quantify it. The 0.2°C are substantial, given that global mean temperature is currently about one degree higher than in pre-industrial times, and governments worldwide agreed to stop the increase well below two degrees. [Read more ...](#)

## **Publication Highlights**

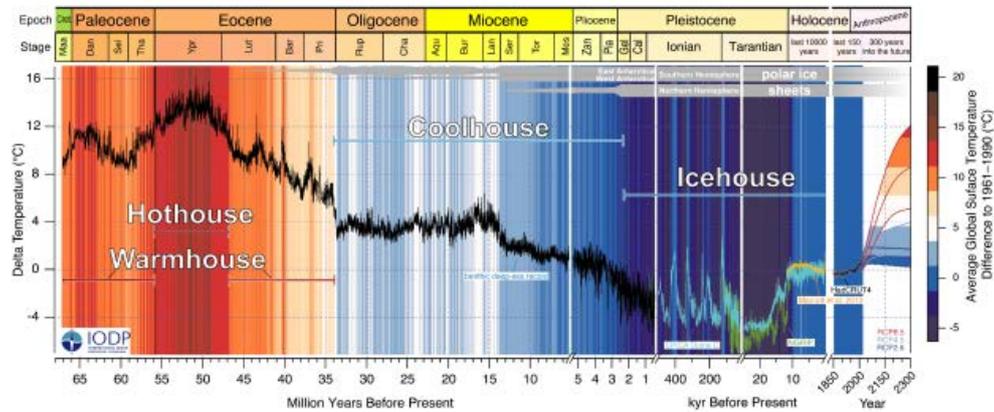
### **Peatland rewetting is an underestimated means to stabilize our climate**

As a means of limiting greenhouse-gas emissions, re-wetting peatlands could be a promising strategy. For the first time, a PIK-led team included peatland emissions, based on computer simulations, in quantitative projections of how global warming can be kept below 2° Celsius. They found that current mitigation pathways do not accurately consider peatlands. To reach climate stabilization targets, peatland protection and restoration must thus be increased – for instance in the current EU agricultural policy reform. "Peatlands cover only about 3% of the global land area. A considerable share has been drained for agricultural purposes, in particular in Europe and more recently in South-East Asia. Once drained, peatlands emit greenhouse gases on the scale of decades to centuries - if not rewetted," explained lead author Florian Humpenöder from Research Department 3. "We were able to show that peatland restoration plays a decisive role: The land area of our planet can only become a global net carbon sink by 2100 – which is what current mitigation pathway studies say should happen – if about 60% of today's degraded peatlands would be rewetted in the coming decades, in addition to protecting intact peatlands." [Read more ....](#)

### **Data from deep-sea sediments used to reconstruct Earth's climate**

An international team led by Thomas Westerhold of MARUM – Center for Marine Environmental Sciences at the University of Bremen and Norbert Marwan from PIK's Research Department Complexity Science analysed data from deep-sea sediments in order to reconstruct Earth's climate changes of the past 66 million years with an unprecedented temporal resolution. They compiled and

analysed a comprehensive dataset obtained from sediment cores from the ocean floor, and used recurrence analysis to reveal hidden relationships and recurring patterns in the climate. The team's new climate reference curve – which shows the climatic changes of the past 66 million years like a colourful barcode – is as published in the prestigious journal Science. [Read more ...](#)



## Other news

### Shaping the energy transition together: new project Ariadne

From our energy supply to the industry and the Paris climate targets, from individual sectors to the big picture: the major BMBF-funded Kopernikus project [Ariadne](#) launched this June at PIK and MCC, with a consortium of more than 25 research partners, is all about providing decision-makers with policy options for the energy transition.

Agreeing on climate targets is one thing, meeting targets quite another, as shown in the first [Ariadne Dossier](#) on hidden risks and chances of a 55% EU climate target. A pivotal part of the project is civic participation. The comprehensive deliberation process launched recently and aims at enriching the mapping of policy paths for action by incorporating the views of citizens into Ariadne's knowledge production. To learn more, follow Ariadne's thread on [Twitter](#) and have a look at these cool booklets (in German) on [renewables deployment](#) and [transport](#) that were developed to inform and inspire.

### New toolkit for decision-makers

Members of RD3 have developed the SENSES Toolkit ([climatescenarios.org](http://climatescenarios.org)) which uses a set of interactive modules to help users understand and explore climate scenarios. Using visualisations, different modules explore, for example, fossil fuel risks or the role of land for food production and climate protection. The target audience comprises finance, policy and regional decision-makers. The SENSES project investigates potential socio-economic futures in the face of climate change and how this knowledge can be made accessible to a broader public. [Read more ...](#)

### More on media

The [Climate Science Information Center](#) launched by Facebook and featuring scientific contributions PIK and other leading institutions has already been mentioned. Talking about Social Media: PIK is now also on LinkedIn! And don't miss out on Johan Rockström's great [TED talk](#) which he presented in the course of TED Countdown, a year-long initiative by scientists, artists, government officials and activists to collectively develop concrete ideas for a cleaner future. It's already been viewed over 1 million times!

## First PIK patent approved in the US

Norbert Marwan and Jürgen Kurths from RD4 developed a new process together with colleagues from the Indian Institute of Technology Madras, using a complex network approach to diagnose thermo-acoustic emissions in combustion processes (e.g. in gas turbines) and help control instabilities. This improves their efficiency and potentially reduces CO2 emissions. An US patent has been approved and an EU patent application is pending.

## Congratulations to ...

... some members and former members of PIK on their appointments or honours:

- Ottmar Edenhofer was jointly awarded the 2020 Deutscher Umweltpreis, Germany's most prestigious environmental prize, of the Deutsche Bundesstiftung Umwelt (DBU). The award was presented by President Steinmeier at a ceremony in October. More details on the [DBU website](#) and [here](#).



- Johan Rockström was elected a member of the German Academy of Sciences Leopoldina in August 2020. The Leopoldina represents the German science community internationally and provides policymakers and the public with science-based policy advice.
- Sabine Gabrysch not only joined the 'One Health' advisory council mentioned above, but was also appointed a member of the federal government's Advisory Council on Global Change (WBGU).
- Norbert Marwan was appointed Privatdozent in Statistical Geosciences at the University of Potsdam
- Ilona Otto has been appointed to a professorship in Societal Impacts of Climate Change at the Wegener Center for Climate and Global Change of the University of Graz. She will continue her association with PIK as co-leader of the EU CASCADES project.
- Christoph Gornott was recently appointed to a professorship in Agroecosystem Analysis and Modelling at the University of Kassel. Christoph will continue to lead the Working Group on Adaptation in Agricultural Systems at PIK.
- Xiaoxi Wang was appointed to an assistant professorship at Zhejiang University.
- Katrin Vohland was appointed General Director and CEO of the Natural History Museum Vienna.

## Forthcoming events

The Cross-sectoral ISIMIP online workshop 2021 takes place from 11th – 15th January 2021 and is open to everyone. The announcement and agenda will be posted here:

<https://www.isimip.org/outcomes/upcoming-cross-sectoral-isimip-online-workshop-2021/>.

The Potsdam Summer School 2021, from 9th – 18th August, has the theme "Water: Our Global Common Good – The Hydrosphere across Land and Sea." The Call for applications is now open at <https://potsdam-summer-school.org/>

FESTTVaL: Applications are open for the hybrid FESTTVaL Summer School 2021 on 'Observing and understanding submesoscale atmospheric dynamics'. See [http://fesstval.de/fileadmin/user\\_upload/fesstval/Files/Flyer.pdf](http://fesstval.de/fileadmin/user_upload/fesstval/Files/Flyer.pdf).

The virtual EGU General Assembly in April 2021. Sessions organised by PIKler and ex-PIKler include:

- "Atmospheric Rossby waves and Jet Dynamics, and their Impacts on Extreme Weather and Climate Events" (conveners include Kai Kornhuber). Details and abstract submission [here](#) until 13.01.21.
- "Characterizing interactions between ice sheets, solid Earth and sea level by observations, data assimilation and coupled modelling" (conveners include Ricarda Winkelmann, Thorsten Albrecht and Kira Rehfeld). Details and abstract submission [here](#) until 13.01.21.
- "Tipping Points in the Earth System" (conveners include Niklas Boers). Details and abstract submission [here](#) until 13.01.21.
- "Earth resilience and tipping dynamics in the Anthropocene" (conveners include Jonathan Donges and Ricarda Winkelmann). Details and abstract submission [here](#) until 13.01.21.

### PIK's Alumni programme

Due to limited resources we cannot provide our alumni with very regular news or updates. But we are nonetheless grateful to all of you just for being part of the PIK Alumni programme! Our database now contains:

- over 50 former PhD students now working in 12 countries,
- around 40 former postdoctoral researchers, senior scientists or project leaders now working in various institutions and branches in Germany and abroad,
- a good bunch of both former international guest scientists and former research assistants or masters' students who spent periods at PIK and have joined the alumni programme.

PIK's Alumni are an important resource so we have a big favour to ask: We'd like to know of any Alumni who would be prepared to offer a younger scientist in their field the benefit of their experience and advice, who might be able to offer insights on career choices, or even might be prepared to host a doctoral researcher for a short research visit? Please get in touch if you feel you could offer any sort of informal "mentoring" to a younger colleague from PIK.

I hope you have enjoyed this newsletter!

Alison Schlums

Alumni Officer

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## IMPRESSUM

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## KEEPING IN TOUCH

Find PIK on Facebook: <https://de-de.facebook.com/PIKPotsdam/>

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See PIK research on Youtube: <https://www.youtube.com/user/PotsdamInstitute>

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## NEWSLETTER

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## KEEP US UPDATED

If you have moved to a new job or your contact details have changed, please let us know by sending an email to [alumni@pik-potsdam.de](mailto:alumni@pik-potsdam.de).

## DATA PROTECTION STATEMENT

We use your data to keep in touch with you as Alumni, to provide you with occasional news about the Potsdam Institute and its activities, and to send targeted information about scientific and other events. PIK's full [privacy policy](#) can be found on the PIK website (Section 7.2. relates to Alumni). If you have any concerns or queries about the use of your personal data, please contact us.

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